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ABSTRACT

Students enrolled in classes which stressed learning theory and human development served as subjects in an investigation of the predictive power of observation scores compared to more traditional predictors such as grade point average and ACT scores. A stepwise discriminant analysis was employed, using the BMDP7B program on the Sperry 1100 Univac, to distinguish the relative predictive strength of the selected variables on the dependent variable of achievement reflected by grade. In step one of the analysis, observation scores were significantly above the other variables, confirming our basic hypothesis. Step two in the analysis revealed significance of the observation scores and the college grade point average scores. Results would suggest that learning which occurs through observation of selected principles compares more than favorably with standardized testing and grade point averages in predicting success in field based learning. (Author)

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Predictor and Performance Variables in a Performance Based Education Course

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Paper presented at the Thirteenth Annual Meeting of the Mid-South Educational Research Association in Biloxi, Mississippi, November 6-8, 1985.

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Abstract

Students enrolled in classes which stressed learning theory and human development served as subjects in an investigation of the predictive power of observation scores compared to more traditional predictors such as grade point average and ACT scores. A stepwise discriminant analysis was employed, using the BMDP7B program on the Sperry 1100 Univac, to distinguish the relative predictive strength of the selected variables on the dependent variable of achievement reflected by grade. In step one of the analysis, observation scores were significantly above the other variables, confirming our basic hypothesis. Step two in the analysis revealed significance of the observation scores and the college grade point average scores. Results would suggest that learning which occurs through observation of selected principles compares more than favorably with standardized testing and grade point averages in predicting success in field based learning.

Predictor and Performance Variables in a Performance Based Education Course

Thomas M. Hughes, Ed.D.

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Purpose

While designing an undergraduate performance based core course in Human Development and Learning Theory, a field based component was initiated which required twelve hours of observation in a school setting under the supervision of a regular classroom teacher. Specific observation criteria were established and students were required to give written reports of their observation which would minimally influence their grades. Up to ten points could be acquired through observation. Thus, our course was perceived as stressing competency because we emphasized the gaining of concepts in our classroom as well as through observation of those concepts in the actual classroom setting. In a generation of falling test scores, we felt obligated to insure concept gain.

Previous research efforts gave a sense of direction in the design of our course. Hughes, Ballance, and McGee (1974) found that it was both possible and practical to "teach a behaviorally engineered classroom on a competency basis and produce essentially the same cognitive and attitudinal outcomes as that produced in a traditional class which concentrated on cognitive material."

In a subsequent experimental design, Ross, Hughes and Hill (1981) used an educational psychology classroom setting to demonstrate statistical significance in favor of an experimental group of teacher trainees who were given field observation experiences and classroom teaching compared to a control group utilizing only the classroom mode.

Having established our course as competency based and field based, the

question was raised as to the efficacy of traditional predictors of academic success such as ACT scores and high school GPA in predicting the success of people in our field based designed course. One must find it difficult to disagree with Jensen (1972) and his belief that I.Q. is the single best predictor of academic performance. Yet, one must be aware that success has many factors, some of which are non-intellective and correlate very well with college success. Lenning, et al. (1974), espoused the strength of the variables of personality, motivation, health and maturity as having good correlative strength with academic success. With such variation among factors in predicting academic success, we established a basic hypothesis:

> Observation scores (field based component) would serve as an equal or better predictor of academic success in the course as ACT scores, high school GPA, objective scores on class tests, and college GPA.

Method

One hundred and seventy-nine students from an educational course, that stressed educational psychology principles of learning and human development, served as subjects in the data gathering project. As shown in Table 1, the average age was 21.2. There were a majority of sophomores and juniors compared to freshmen and seniors.

Insert Table 1 about here

These university subjects were part of a preservice training mode for teachers at Memphis State University. They were required to take four objective tests during the semester for a possible total of one hundred points. Essay questions were not used. Their tests were computer scored and computer analyzed for validity and reliability and found to be within

acceptable limits. Lectures and discussions of the concepts of human development and learning theory were given three times each week. After the third week, the subjects were provided a set of observation criteria (related directly to concepts taught in the course) to use in a public school setting. The observations were to include the following principles: positive reinforcement, negative reinforcement, punishment, modeling behavior, Premack principle, and developmental norms. Students were asked specific questions about each principle. For example, on the principle of negative reinforcement, the students were asked to describe the situation in which the negative reinforcer was applied. In addition, they were asked what served as the negative reinforcer, by whom administered, what behavior the user was trying to strengthen, and what was the immediate effect and the intended long-term effect. The rationale was that both observation and class discussion of the criteria would enhance competency. That is exactly what was found by Ross, Hughes, and Hill (1981). The question that emanated from that experiment was one of speculation as to the predictive power of one's performance in an observational setting compared to the known and lauded predictive ability of such tests as the ACT and one's high school grade point average. In other words, one's ability to describe a situation in which reinforcement was used to motivate may have equal or better predictive scores than a multiple choice question which requires one to pick out an imbedded correct answer from four or five distractors. It seemed to us that the power of a competency or field based program would hinge on the prediction ability of the quality of that observation experience.

When the classes had completed their testing and observation, data sheets were prepared to tabulate the following variables: (1) ID, (2) Age, (3) Sex, (4) Class, (5) High school GPA, (6) College GPA, (7) ACT scores, (8) objective testing scores, (9) Observation scores + objective score, (10)

Final grade, (11) Observation scores = 9-8.

The BMPD7M statistical program for stepwise discriminant analysis was employed on the Sperry Univac 1100 Computer. Since there were missing data from some of the student records, we believed the BMPD would have the best probability of ajudicating the situation. The computer reac 179 cases, chose 109 cases that had at least one score missing. Seventy cases were fully intact.

Results

Table 1 gives the means and standard deviations of selected variables grouped by final grade category. It would appear that as age increased, the mean scores of past and present performances increased. Such a finding is not unusual, given the general expectation that maturity is a factor in achievement.

Table 2 conveys the significance reached by observation scores and college GPA in the two step discriminant analysis. Our basic hypothesis was confirmed in that the .05 level of significance was exceeded for the Observation Scores in the first step and was significant beyond .05 for College Grade Point Average in the second step of the discriminant analysis.

Insert Table 2 about here

Discussion

Becoming directly involved in one's academic learning via selected observations and experiences appears to be gaining momentum and has the approval of more than a few educators and psychologists. However, such enterprise is not exactly pristine. No less a personage than John Dewey fostered such an idea over fifty years ago. Somewhere in between his time

and ours, the perception was changed to both predict and direct academic success by standardized testing and to measure the effects of learning in the same manner. The time may well be upon us, in an age of competency based and field based education, to give more consideration to what is learned by observation and what may be predicted about academic success relative to our ability to learn by observation.

Using the power of discriminant analysis, our data would strongly support the efficacy of one's learning by observation as one vehicle for mastery type learning that has excellent predictability of one's success in gaining concepts. In this instance it was significantly better than ACT and high school GPA. There is perhaps one other reliable outcome from our findings. Educational psychologists of the future may be utilizing more natural behavior such as observational learning on the dependent variable of achievement compared to what a number of professionals consider the rather sterile, unnatural world of standardized testing.

Table 1

Means and Standard Deviations of Selected Variables by Grade Achieved

All

	Grade	F	D	C	B	A	GPS
Variable $\bar{X}$							
2	Age	19.80	20.285	20.909	22.157	23.0	21.285
5	HSGPA	2.558	2.4685	2.868	2.960	3.071	2.848
6	CGPA	1.826	1.954	2.284	2.706	3.085	2.401
7	ACT	14.0	14.0	15.6	18.157	23.5	16.7
11	OBS	2.20	6.0	7.636	8.578	9.33	7.485
Variable S.D.							
2	Age	1.923	1.603	2.097	4.657	4.049	3.146
5	HSGPA	.537	.785	.509	.480	.662	.547
6	CGPA	.337	.209	.388	.460	.575	.411
7	ACT	2.915	2.708	3.613	3.891	4.183	3.628
11	OBS	3.03	3.14	1.673	1.538	.861	1.898

Table 2

Stepwise Discriminant Analysis

Step Number 1

Variable	Wilks' Lambda	Approxmiate F Statistic	D.F.	F
11 OBS	.5407359	13.802*	1/65	4.0

Step Number 2

6 CGPA				
11 OBS	.3453715	11.226*	2/64	3.15

Remaining Variables Ranked by F to Enter

	F to Enter
7 ACT	2.515
5 HSGPA	1.266
2 Age	.406

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* Sig. .05

Profile of Authors

Thomas M. Hughes is an associate professor of educational psychology at Memphis State University. He received his Ed.D. from the University of Tennessee. His research interests include learning environments, personality variables, and behavior management. Cordelia Douzenis, M.S., is currently pursuing a doctoral program in educational research at Memphis State University.

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